EVOLUTION ENGINE
AEROCHARGER
SYSTEM
INSTRUCTION MANUAL

First Choice Turbo Center, Inc.
1558 W. Henrietta Road
East Avon, NY 1441

BEFORE YOU BEGIN...
UNDERSTAND THE FOLLOWING:

The Aerocharger is unlike conventional turbochargers. It utilizes ultra-high precision ball bearings and extremely close tolerances in assembly and orientation.

TAMPERING WILL VOID WARRANTY!
IT IS NOT FIELD ADJUSTABLE OR SERVICEABLE!
NEVER LOOSEN CENTER SECTION CLAMP!
DO NOT ATTEMPT TO ADJUST BOOST CONTROLLER MODULE! CONTROLLER SCREWS DETERMINE VANE SETTINGS, NOT BOOST LEVEL!

The Aerocharger will greatly enhance the performance capabilities of the Evolution engine. The Aerocharger greatly increases the torque and horsepower of any engine, without lag time normally associated with turbocharging. An Aerocharged motorcycle, if operated recklessly, can experience severe wheel spin and/or lifting of the front wheel.

AEROCHARGED MOTORCYCLES MUST BE OPERATED ONLY BY HIGHLY EXPERIENCED RIDERS!

Evo Engines and transmissions have proven to have ample strength to handle 120 ft.-lb. of torque. Low engine speed is the key to longevity; increasing engine speed beyond stock causes engine components' stresses to increase as the square of the RPM. The Aerocharger allows unprecedented horsepower to be achieved at stock operating speed, avoiding high RPM wear and vibration.

However, any high horsepower engine can wreak havoc on itself and the motorcycle drivetrain if operated recklessly. Powershifting (leaving the throttle wide open as the gears are changed) an Aerocharged engine will eventually destroy the clutch, transmission and/or final drive, and may cause engine damage by running against the rev limiter for extended periods of time.

ROLLING OFF THE THROTTLE WHILE SHIFTING IS HIGHLY RECOMMENDED!

It is recommended if you have a new bike to break it in at least 1,000 to 1,500 miles before installing this kit. If you are unable to resist the temptation of installing your Aerocharger system before the break-in period, we recommend that you hone the cylinders .0025" - .0030" over to provide adequate clearance for piston growth.

High horsepower engines require premium grade gasoline. Aerocharged Evo engines require 92+ octane unleaded gasoline at sea level to prevent detonation at 11 PSI of boost. Higher altitude riding requires 90+ octane. We have logged over 20,000 sport riding and touring miles on our Aerocharged Evo engines with zero detonation. Lower octane can be used for cruising, but periods of operation on boost should be restricted to short bursts. Due to size restrictions, Aerocoolers (charged air intercoolers) are not intended for continuous duty at full boost. After 8 to 15 seconds (depending on model), Aerocooler efficiency will drop, and detonation resistance will be diminished. High ambient temperatures and heavy loads make octane requirements more stringent.

ANYTIME AUDIBLE PINGING IS HEARD, OR POWER BEGINS TO FADE, LET OFF THE THROTTLE IMMEDIATELY OR SERIOUS ENGINE DAMAGE MAY OCCUR!

THE AEROCHARGER AND ITS FUNCTION

The Aerocharger is a unique form of turbocharger, which delivers boost faster, at lower RPM, than any existing form of turbo or supercharging! The Aerocharger utilizes air cooled, ultra-high precision ball bearings to support the exhaust and intake turbine shaft. It has a small reservoir of lubricating oil on the intake side of the unit, which wicks a very light mist of oil to the bearings. There is enough oil contained in the unit for 700 hours of full boost operation.

This patented ball bearing system is extremely low in friction compared to conventional plain turbo bearings which require large volumes of engine oil for lubrication and cooling. It is also very durable, and easily passed Mercedes Benz' stringent durability requirements (Mercedes offers our Aerocharger on its Unimog utility vehicle).

The Aerocharger controls its boost pressure via a series of moveable wing-like vanes inside the cast nickel alloy exhaust turbine. The vanes direct the flow of exhaust gas to the exhaust turbine wheel, adjusting the velocity of the gas in response to changes in intake air pressure. These moveable vanes are continually adjusted by a preset external pneumatic controller. On the Harley system, the controller is factory preset to deliver 11-11.5 PSI of boost pressure which, combined with the recommended ignition timing, allows the stock 1340 Evo engine to operate powerfully and reliably on premium grade unleaded pump gasoline.

The model 101-200 Aerocharger supplied with the Harley system has the capacity to flow only enough air to efficiently make 110-120 rear wheel horsepower. Raising the boost to a higher level invites turbine over-speed and damage, high intake charge temperature, and poor performance. Larger Aerochargers are available from FCTC for custom applications.

THE FUEL SYSTEM

The 42mm Mikuni turbo carburetor is calibrated specifically for the Aerocharger'. Adjusted properly, it will provide instant, burble-free throttle response, while delivering excel-lent touring fuel economy. We have operated our Aerocharged bikes from sea level to 6000 ft., and had crisp, burble-free performance.

Carburetors deliver the correct amount of fuel to the engine by sensing what is referred to as "pressure differential" between the float and the venturi area inside the throat of the carb. The Aerocharger" carb has its float bowl vents pressurized by boost pressure. During operation on boost, the pressure in the high velocity venturi area is slightly lower than the float bowl area, and the fuel is forced up the needle jet into the venturi.

Because the float bowl area is pressurized, standard gravity feeding the gasoline into the carb will not work. The Aerocharger carb has a smaller 1.5mm needle and seat, and is kept full by a unique boost sensing fuel system.

An EFI style high pressure constant flow fuel pump is utilized, which is regulated to about 35 PSI by a brass "bypass valve" which continually returns excess fuel to the tank (via the vent lines connecting the two tank halves). A red domed boost sensing final fuel regulator, delivers fuel pressure to the carb at between 3-1/2 and 5 PSI higher than boost pressure. For example, at 10 PSI of boost, we need 15 PSI of fuel pressure to ensure smooth fuel delivery. This is a proven, reliable system that is currently being utilized on over 600 Aerocharged snowmobiles and motorcycles.

The fuel system and carburetor will flow, at maximum, enough gasoline to reliably make 110-120 rear wheel horsepower. That is why it is hazardous to attempt to override the boost setting of the controller.

Too high a boost setting will result in high speed lean out and engine damage, as well as possible Aerocharger overspeed and destruction.

ALL AEROCHARGER° SYSTEMS ARE DESIGNED TO MAKE RELIABLE TORQUE AND HORSEPOWER. RAISING BOOST LEVEL INVITES EXPENSIVE PROBLEMS.

Anyone desiring to utilize an Aerocharger' on a larger than 1340 cc engine should consult FCTC for recommendations.

THE AEROCAMSHAFT

The camshaft supplied with the Aerocharger' system is optimum for reliable turbo horse-power at stock RPM, while delivering excellent fuel economy. Stock valve train components are fine. The Aerocam allows the engine to generate 10-20% more torque and horsepower at 11 PSI of boost. Stock camshaft timing is very acceptable with the Aerocharger", but engine output per pound of boost will be slightly lower.

OPERATION OF THE AEROCHARGED EVO ENGINE

As is discussed in the instruction manual, engine warm-up is extremely important to maintain the integrity of the head gaskets, and to preheat the Aerocharger' a bit.

One unique feature of the Aerocharger" is its ability to build instant boost. It will truly amaze those familiar with turbochargers when four or more PSI of boost appears when blipping the throttle in neutral. Full boost will not be observed until the engine is under load.

Driving the Aerocharged motorcycle is no different than driving a stocker. Acceleration, however, is achieved at an extremely rapid rate, and extreme caution must be exercised. When cruising at the legal speed limit in high gear, some boost pressure will be observed, which is nor mal. It would, however, be wise to avoid lengthy periods at high boost; the standard 1.25" thick Aerocooler is designed for intermittent use during touring and sport riding, and it is possible to exceed its cooling capacity. When that occurs, intake charge temperature will climb, power will drop, and detonation resistance will be reduced. Anyone wishing to operate at high engine loads for extended periods of time should consult FCTC for Aerocooler upgrades and advice.

ALWAYS PURCHASE THE HIGHEST POSTED OCTANE GASOLINE AVAILABLE.
IT IS ALSO WISE TO FOLLOW HARLEY'S BREAK-IN PROCEDURE BEFORE OPERATING THE ENGINE UNDER BOOST! AFTER ENGINE BREAK-IN, WE SUGGEST THE USE OF EITHER AMSOIL **20W-50** OR MOBIL 1 **15W-50** SYNTHETIC OIL.

- The Aerocharger is not yet certified by the GARB, and like all other engine/carburetor/exhaust system modifications, is not currently legal for use on California highways. It is currently being sold for off road use only. Other states may have similar regulations- every user should check local state ordinances regarding on-highway use.

- All Aerocharger system installations should be done by a trained professional mechanic.

- Consult HD Service Manual for camshaft installation instructions.

TORQUE AND HORSEPOWER

The Harley-Davidson aftermarket industry thrives on the power of exaggeration. It's tough for the consumer to make intelligent decisions when it comes to increasing the performance of the Evo engine.

The Aerocharger will forever change the world of Evo performance.

We have spent countless hours testing components on what has become the industry standard, the DynoJet rear wheel inertia dynamometer. Measuring the torque and horsepower at the rear wheel, the DynoJet computer uses the conservative SAE correction factor, which estimates how much power the engine will make at 77°F, at 700 ft. above sea level. Some dyno testers use more optimistic "standard" correction factors, some even calibrate their dynos to read "happy numbers". Some take readings at the crankshaft. All torque and horsepower numbers are not created equally.

Stock 1340 Evo engines dyno at 60 real ft.-lb. of torque and 50 real hp. The Aerocharger®, on pump gas, will safely and reliably double those numbers*. The most impressive and shocking thing about the Aerocharger dyno readings is the monstrous torque at low RPM. This is what Aerocharged Harley riders feel and enjoy when rolling the throttle in fifth gear.

While it's fun to talk about peak dyno horsepower, remember that much of what you read in print is pretend. Real gobs of broad, Aerocharger induced midrange torque and midrange horsepower are the key to excellent performance. 100-120 ft.-lb. of real Aerocharged torque is something few Harley owners have ever felt, and those who own one have said that it magnifies many times their enjoyment of what is already a great motorcycle.

We at FCTC are delighted to share the Aerocharger experience with Harley Evo owners. We invite comments and suggestions for improvement.

Please drive safely and have many years of enjoyment with the Aerocharger.

** With the small 1-1/4" thick intercooler, 1340 Aerobikes are averaging 100-115* ft.-lb. *and 85-100 hp.*

TERMS OF SALE OF AEROCHARGER SYSTEMS AND COMPONENTS

AVAILABILITY OF PRODUCTS
All items will be shipped according to availability on a first come, first served basis. FCTC will not be responsible for financial losses due to delayed shipments.

BACK ORDER POLICY
Out of stock orders will be held until products are available. Purchaser will be notified prior to shipment. Back orders will receive priority over new orders.

METHODS OF PAYMENT
There are no open accounts. All shipments will be made with payment in advance by check (allow one week to clear), Visa/MasterCard, or C.O.D. (cash or certified check). C.O.D. purchasers will be notified prior to shipment so that cash or certified check can be made available. All foreign orders must be prepaid.

METHODS OF SHIPMENT
UPS is our preferred carrier, but FedEx, US Postal Service, or any other carrier of your choice can be used.

PRICES & PRODUCT SPECIFICATIONS
Prices listed in our catalog do not include shipping and handling charges, which are added to each invoice. All prices subject to change without prior notice. NY residents must pay the appropriate sales tax. Minimum order requirement is $50.00. Prices, materials, design, and specifications are subject to change without prior notice. All merchandise information presented in the catalog was true and correct at time of publication.

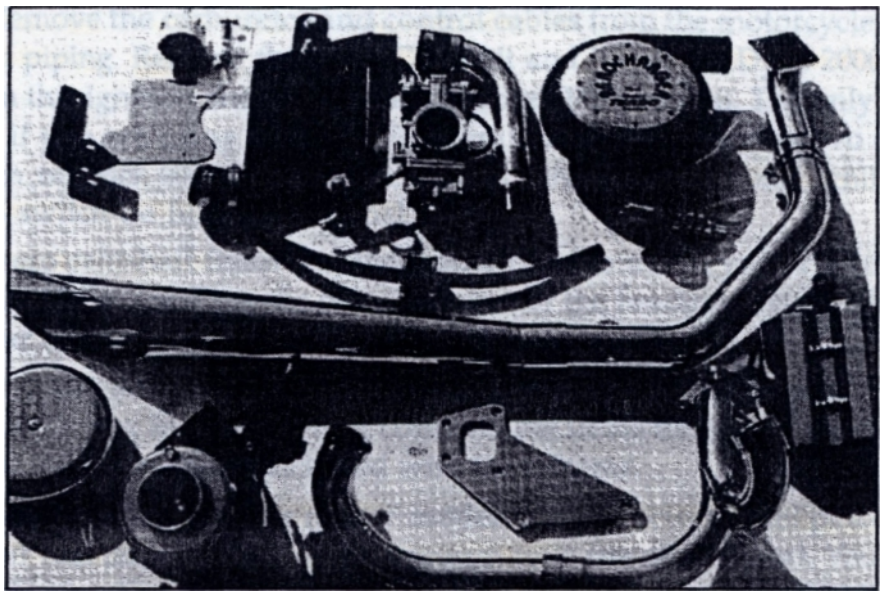
RETURN POLICY
No items may be returned without prior authorization. All returns are subject to a 30% restocking fee. Customers refusing shipments will be liable for freight and handling charges, in addition to the 30% restocking fee. Items being returned for repair or replacement must be accompanied by a Return Authorization (R.A.) number, along with an explanation of problem.

TECHNICAL SUPPORT/INFORMATION
Technicians are usually available at XXX-XXX-XXXX during normal working hours (EST) to help address installation or tuning difficulties.

SHORTAGES & WARRANTIES
Any shortages from the parts list must be reported within three days. All Aerocharger' system components carry a sixty day replacement or repair warranty from date of purchase. Warranty will cover Aerocharger system components only- difficulties with engine or chassis arising from the use of the Aerocharger are solely the responsibility of the purchaser. FCTC will not pay any labor or towing expenses arising from the failure of any system components.

HARLEY DAVIDSON

ROAD KING



AEROCHARGER SYSTEM

INSTALLATION INSTRUCTIONS

Congratulations on your purchase of a First Choice Turbo Center Aerocharger system for your motorcycle. Proper installation and operation will give you the acceleration of a stroker, with the cruisability of a stocker.

Please inspect the contents of your Aerocharger' kit. Become familiar with all items and check them off against the contents list found in this book. Please contact your point of purchase if you have found any discrepancies. All kits are double checked prior to shipment.

INSTALLATION PREPARATION

1) In a well-ventilated area, free of fire and spark hazards, completely drain the fuel tank and remove. Remove the carburetor and control cables from the motorcycle. Remove all exhaust system piping. Remove the stock CDI unit and install the Dyna 2000 in its place. All switches on this ignition should be placed in the OFF position. The only exception to this would be if you are using a Single Fire ignition system that has two coils. In this, instance, switch number six (6) should be turned ON. This electronic ignition requires that the VOES switch be fully operational.
2) Install the Aero camshaft following the instructions found in your Harley-Davidson' service manual. While installing the camshaft, install the headgaskets supplied with this kit. *(Refer to your Harley-Davidson" Service Manual for instructions.)*
3) If the oil filter on your motorcycle is located in the front of the engine, it will require relocating. Find the box in your kit that contains the items necessary for relocating the oil filter. Follow the instructions included with these items.
4) If your motorcycle is a 1994 or newer model, a non-vacuum fuel petcock must be installed in your fuel tank in place of the vacuum type *(see photo below). You* may obtain this from your Harley-Davidson® dealer. Specify a non-vacuum petcock, 1992 or earlier.

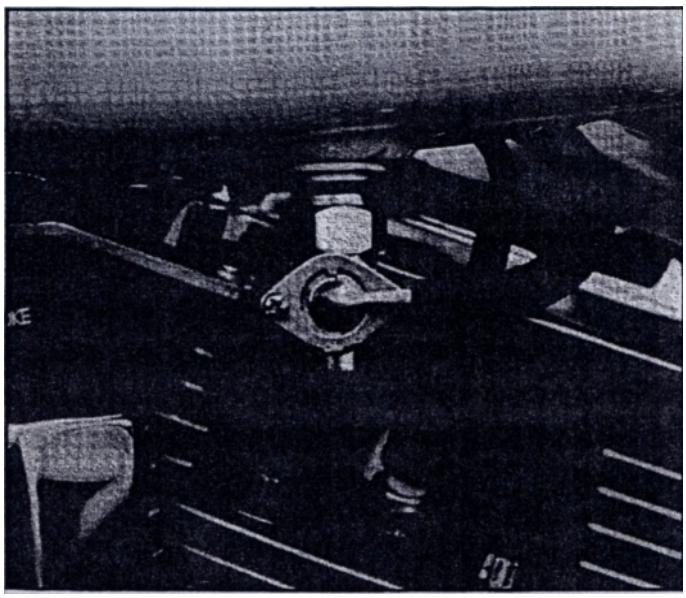


Photo shows installation location of non-vacuum petcock

AEROCHARGER MOUNTING PLATE INSTALLATION

5) Remove the 5/16" bolt found running through the cases at the base of the front cylinder. Replace it with the 5/16" x 4-1/4" stud found in the hardware kit. Put on the right hand nut at this time.

6) Remove the left nut from the thru stud found running through the cases central to the base of the cylinders. Back off the right hand nut on this stud until only one or two threads are left on the end.

7) Tap the stud through the cases with a piece of wood (hammer handle) until the nut is flush on the right side. Trial fit the Aerocharger mounting plate on the protruding stud ends on the left side. *(The domed shoulder nut will be used on the end of the stud to mount the Electronic Fuel System.)*

8) The mounting plate should not touch the front cylinder cooling fins. If it does, care-fully file these fins until the mounting plate fits tight to the engine cases with at least an 1/8" air gap between the fins and the plate.

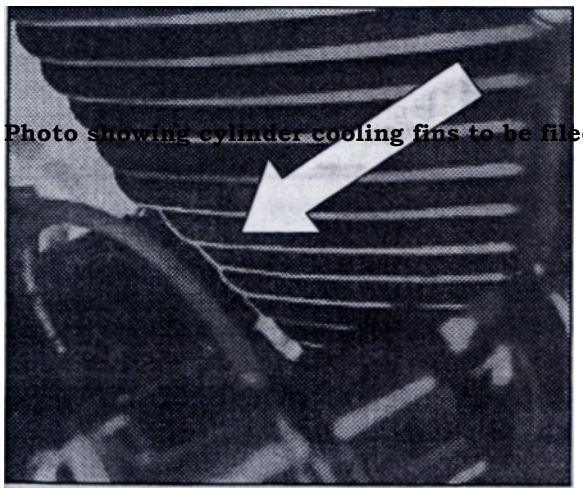


Photo showing cylinder cooling fins to be filed to accommodate Aerocharger mounting plate.

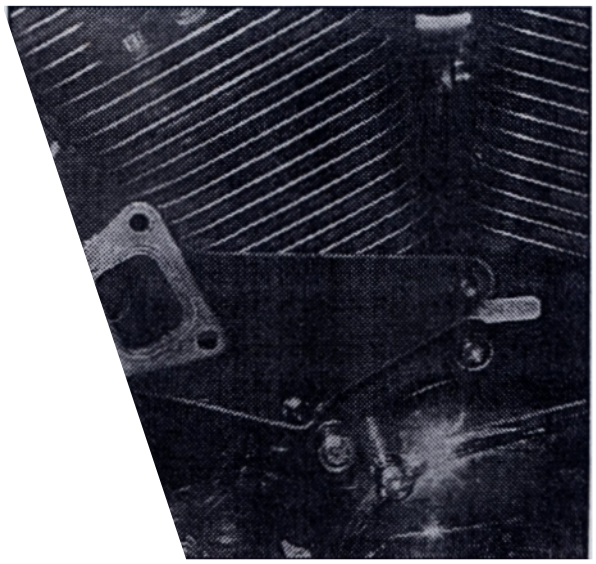


Photo showing location of the installed Aerocharger mounting plate

EXHAUST HEAD PIPING INSTALLATION

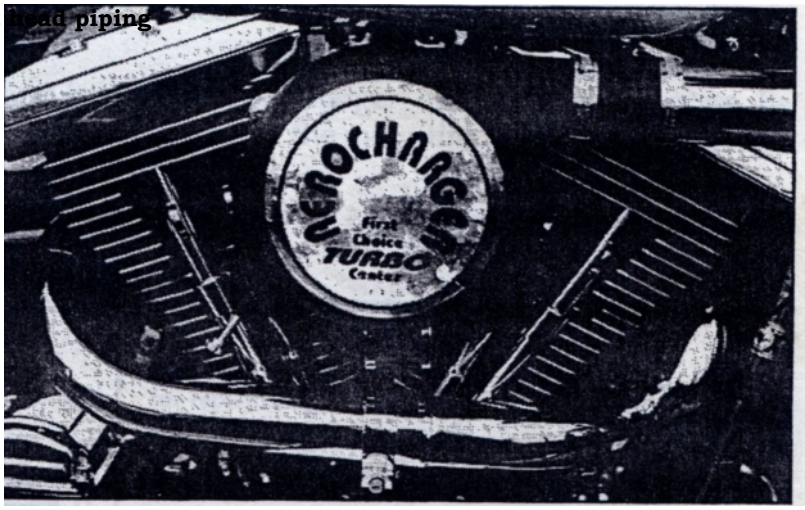
9) At this time, install the exhaust head piping, drawing up the flange nuts evenly and uniformly head-to-head.

10) If the turbo flange on the head pipe cannot be lined up with the Aerocharger mounting plate, remove mounting plate and bend pipe for alignment with a hammer handle in the flange opening.

11) With the plate slack on the studs, use punches or dowels to align the plate with the exhaust flange. Temporarily install a couple of bolts to hold the plate and flange in alignment

12) Tighten the front stud nut to hold the Aerocharger mounting plate tight to the engine.

Photo showing position of exhaust head piping



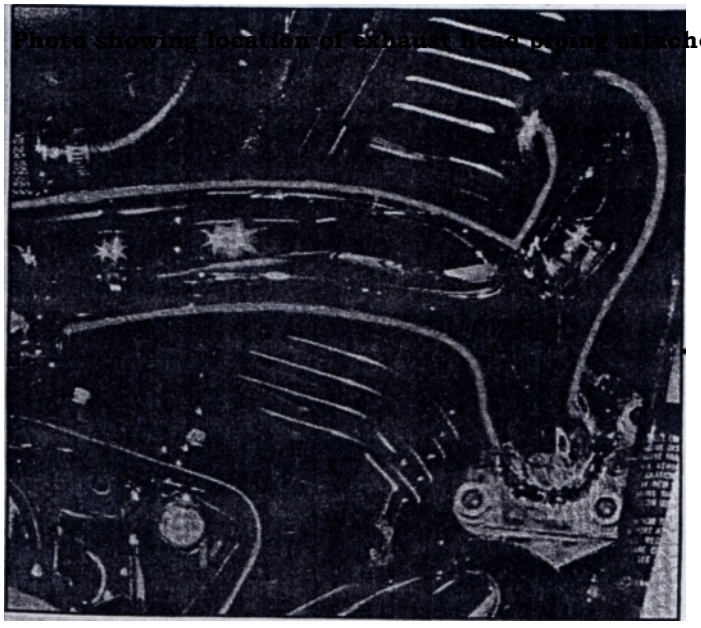


Photo showing location of exhaust head piping attached to Aerocharger mounting flange.

AEROCHARGER INSTALLATION

13) Carefully unpack the Aerocharger and read the WARNING label found on the unit.

14) Remove the vent plug located in the top and carefully pour in the special synthetic Aerocharger oil that is included with the unit. The Aerocharger now contains sufficient oil for 700 hours of full throttle operation.

15) When changing the oil in the motorcycle, remove the vent plug and check the oil level in the reservoir with a clean wire. When the level drops to 3/4", add oil to a level of 1-1/4". Additional oil can be obtained from your point of purchase. Failure to use the special oil manufactured for use in the Aerocharger will void the warranty.

Note: The Aerocharger must be level.

16) Remove the shifter linkage cover. The linkage rod will have to be flipped over and shortened to 1-1/2" when it is reattached to provide clearance for the Aerocharger. The forward shifter needs to be sent to First Choice Turbo Center, Inc. for modification to clear the Aerocharger°.

17) Remove the temporary bolts and install the Aerocharger on the mounting plate. Be sure to place a stainless steel gasket on both sides of the mounting plate.

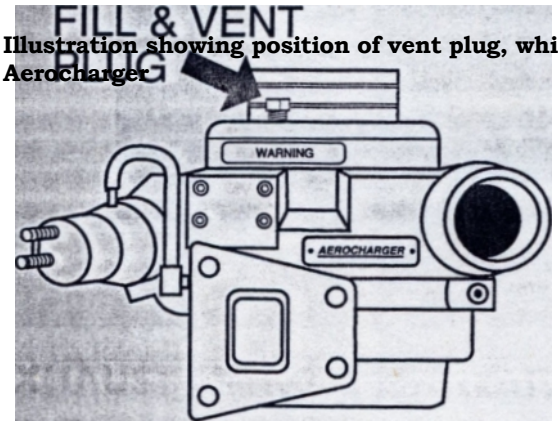
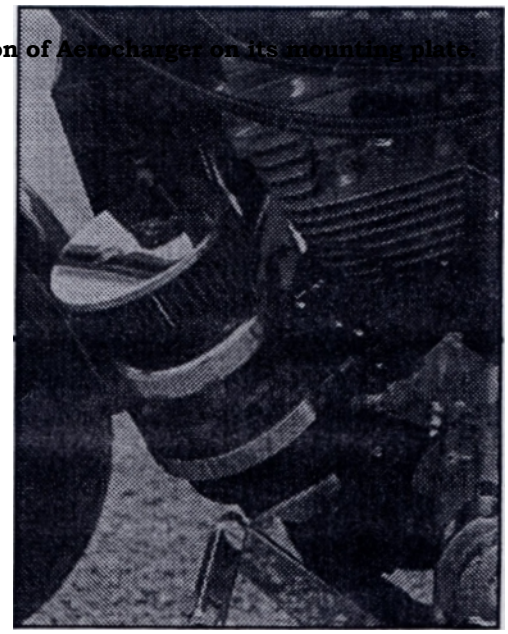


Illustration showing position of vent plug, which is also used for replenishing oil level in the Aerocharger

Photo showing location of Aerocharger on its mounting plate.

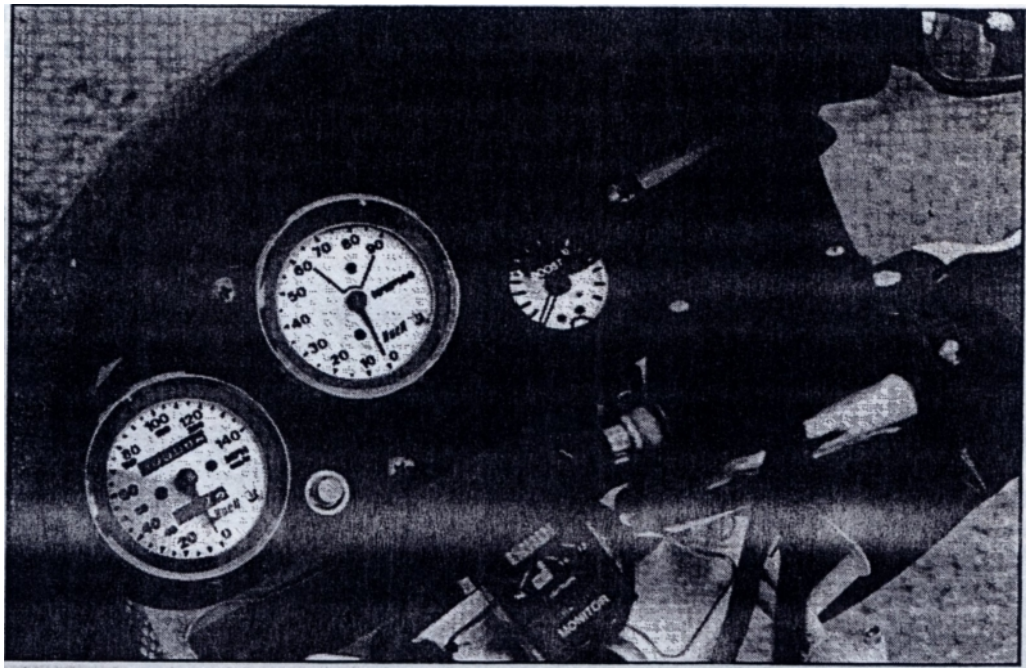


BOOST GAUGE INSTALLATION

18) If you purchased a boost gauge, suitably mount the gauge in a method of your choosing.

19) Route the negative (- black) and positive (+ red) to existing sources, such that lighting is provided for the gauge when the ignition switch is turned "ON".

20) The boost hose for the gauge should be routed to the back of the air intake plenum and attached to the existing rubber capped barb.



Typical boost gauge installation
(Shown here on the Buell Thunderbolt).

EXHAUST PIPING INSTALLATION

21) The remaining exhaust piping may now be installed. Be sure to place the stainless steel gasket between the exhaust pipe flange and the Aerocharger exhaust outlet.

22) Start to draw up the nuts and bolts together evenly.

23) The mounting tab on the front exhaust pipe should be placed underneath the bracket on the bike. Slide the megaphone bracket into the rubber mount, while slipping the flared end over the front exhaust pipe.

24) The 2-1/4" stainless hose clamp should be placed around the exhaust pipe, and the curved clamping bracket should be mounted on the bike under the transmission end cover.

25) Line everything up for a stress-free fit before tightening up clamps and brackets.

1995 ROAD KING
SPECIAL INSTRUCTIONS FOR MOUNTING EXHAUST PIPE

26) Remove the master cylinder reservoir from the frame. Remove the right front footboard.

27) Install the rear turbo outlet pipe, leaving the clamps loose.

28) Install the megaphone and tighten both clamps.

29) Remount the master cylinder reservoir, placing the supplied 3/4" spacers between the frame and reservoir. Two (2)1 /4 - 20 x 2" bolts are furnished for this purpose.

30) Reinstall the right front footboard; placing two supplied flat washers between the frame and footboard (the stock *bolts are long enough).*

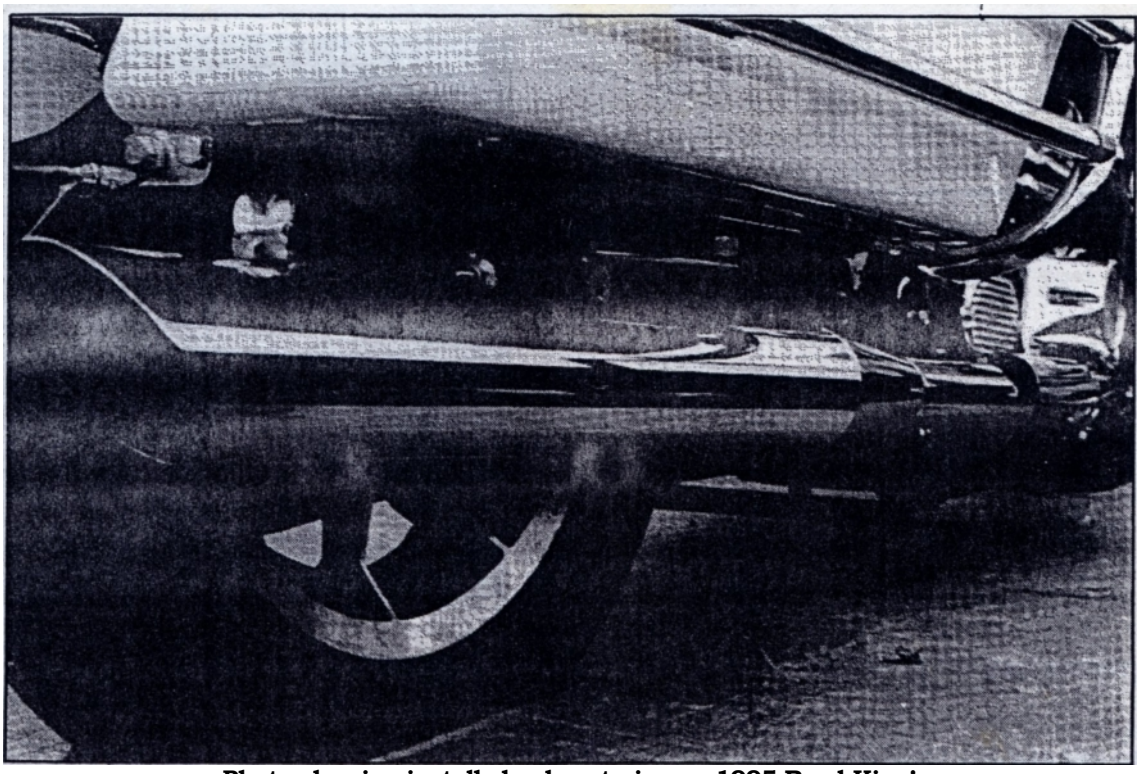


Photo showing installed exhaust pipe on 1995 Road King!

FUEL SYSTEM INSTALLATION

31) Locate the electronic fuel system. This system is mounted on the left side of the motorcycle. The top is attached using the horn mount. The bottom is located over the central case stud that sticks through the rear hole of the Aerocharger' mounting plate. (You will *have to find another place to mount the horn.)*

32) For Hi-Lo switch installation, drill a 1/2" hole in the raised lower left part of the fuel sys-tem cover, about 1/2" from the bottom. Locate the Hi-Lo switch in this location such that the bleed orifice is facing up. This will be "Hi" with the switch up.

33) Splice the "T" into the small rubber hose coming from the boost controller. Do not alter the length of the hose between the switch and the "T". *(See diagram on Page 16.)*

34) Viewing the electronic fuel system from the top, a length of hose with a "T" on its end will be found coming from the gold colored unloader valve. The "T" end of this hose goes on the fuel tanks' cross connect fittings found on the lower front area of the fuel tanks.

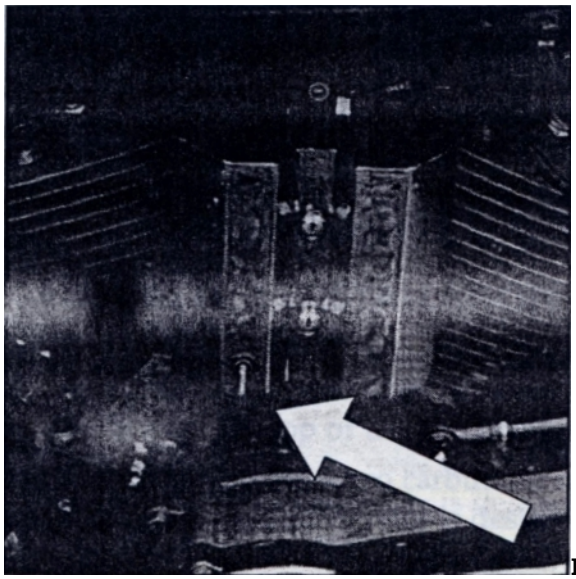


Photo showing location of Hi-Lo switch.

35) The fuel hose that passes through the rubber grommet on the top of the fuel system is to be attached to the non-vacuum fuel petcock on the fuel tank.

36) The remaining fuel hose coming out from the back of the fuel system goes to the carburetor fuel inlet. Secure all hoses with the supplied hose clamps before energizing the fuel system.

37) The smaller hose that is found coming from the "Red Dome" fuel pressure regulator should be routed between the cylinders and over to the carburetor. It will be pushed onto a hose barb on the back of the air intake plenum.

(See diagram on next page)

38) The electric fuel pump should run when the ignition switch is in the ON position (not accessory). If this does not happen, find a terminal that will activate the fuel pump when the ignition switch is ON and attach the wire there. Failure to do this WILL result in severe engine damage.

NOTE. DO NOT LEAVE FUEL PUMP RUNNING WITH FUEL PETCOCK IN THE OFF POSITION. DOING SO WILL CAUSE OVERHEATING OF THE FUEL PUMP, AS WELL AS FUEL PUMP FAILURE!

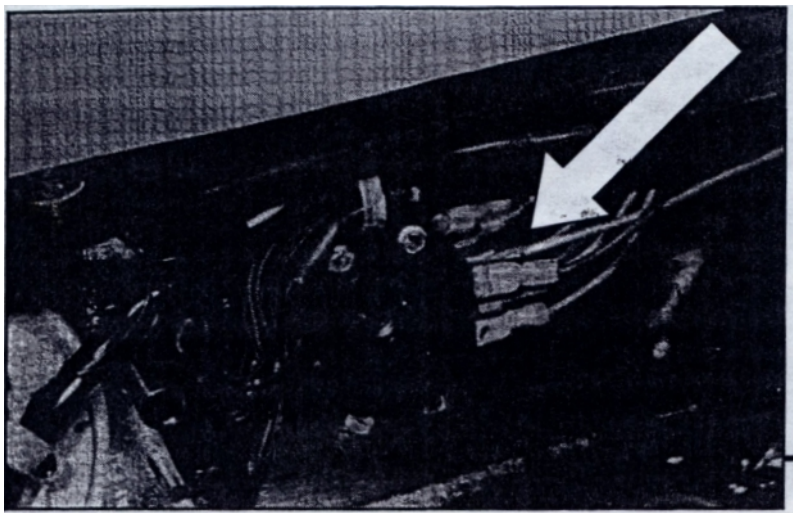


Photo showing location of terminal block and wiring

CARBURETOR INSTALLATION

39) Install the supplied throttle cables onto the twist grip. The cable that has the little spring on it is the throttle closing cable. It is installed in the rear opening on the twist grip and runs over the top of the bell crank on the carburetor.

40) Push the supplied Aero carburetor onto the intake manifold, attaching the choke and throttle cables. This carburetor is designed for, and is to be used with a stock intake manifold only. *('85-'89 bikes must replace the stock manifold and choke cable with a '90 or newer manifold and choke cable.)*

41) The carburetor is held onto the manifold by the carburetor retention bracket which is already attached to the air intake plenum. The bolts used to mount the retention bracket onto the motorcycle are found in the engine breather kit.

42) (1985-1991 models) When mounting the retention bracket, place a flat washer onto the bolt, place the bolt through the hole in the retention bracket, then place the shoulder washer over the bolt with the shoulder facing the bracket so as to fit into the bracket, taking up space between the bolt and larger bracket hole.

    (For 1992 models, please call First Choice Turbo center. For 1993 & newer models, see installation #'s 69-75 on pg. 14 at this time for breather kit installation instructions.)

43) Repeat this assembly procedure for the other bolt, and then attach the air plenum and carburetor retention bracket to the motorcycle.

44) Securely tighten the bolts holding the carburetor retention bracket to the motorcycle. 1994 and newer motorcycles require the use of the crankcase vent kit to install the carburetor. These parts, with instructions, are found in the carton with the oil filter relocation kit.

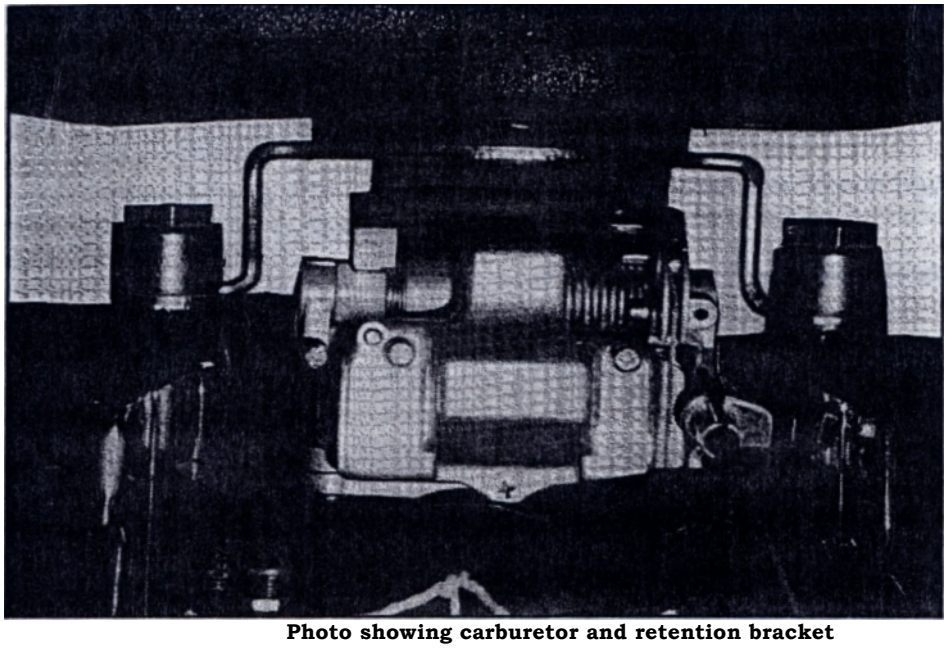


Photo showing carburetor and retention bracket

CAUTION
ANY ADJUSTMENT, ALTERATION, OR MODIFICATION OF THE ACCELERATOR PUMP OR PUMP MECHANISM ON THIS CARBURETOR WILL RESULT IN MECHANICAL FAILURE AND POSSIBLE PERSONAL INJURY

45) Locate the supplied length of small diameter black rubber hose. Attach one end to the barb located on the very end of the turbo boost controller. Route this hose and the small diameter hose coming from the Red Dome fuel pressure regulator to the back of the air intake plenum.

46) Push these onto the two hose barbs found on the back of the plenum. Be sure all hoses are routed to avoid contact with hot surfaces that could damage them.

- Use your stock choke cable with the Mikuni HSR 42 carburetor.
- Do not remove the diaphragm located in the float bowl between the accelerator pump rod and piston.

INTERCOOLER INSTALLATION

47) Install the intercooler on the front frame tubes with the supplied brackets and hard-ware.

48) Remove the top bracket from the intercooler and mount it to the motorcycle using the supplied bolt. The bracket should be bolted to the front of the motorcycle using the existing tapped hole found in the frame junction plate, adjacent to the fork locking lug.

49) Attach the top of the intercooler to the upper bracket using the supplied rubber mount. Taking note of how it is positioned on the mount, remove the pipe clamp from the lower intercooler mount.

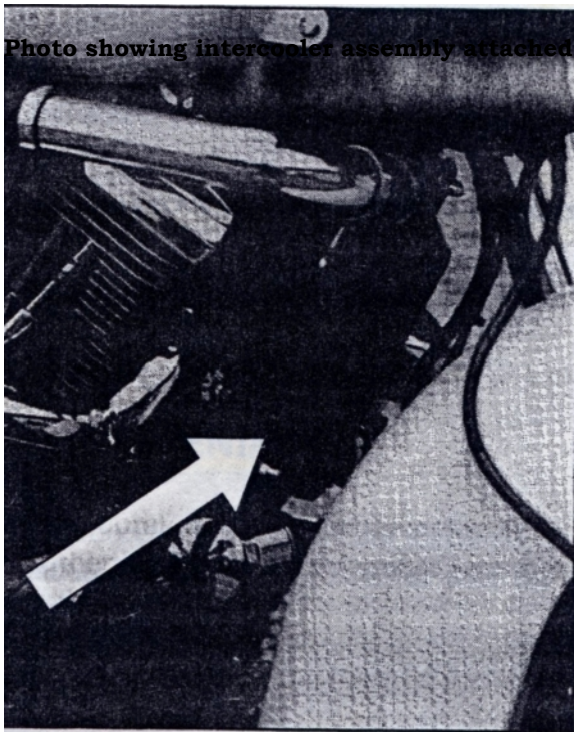
50) Spread open sufficiently to slip over the right frame down tube. Pinch back together and reattach to the intercooler in the same position.

51) Connect the intercooler to the Aerocharger"" with the 22° silicone hose and two damps supplied.

52) Connect to the air intake plenum with the chrome air pipe and accompanying sili-cone hoses and clamps.

53) Check the position and alignment of the intercooler and air pipe before tightening the intercooler mounts and hose clamps.

Photo showing intercooler assembly attached to motorcycle frame



OIL FILTER & CRANKCASE VENT INSTRUCTIONS FOR THE 1993 AND NEWER HARLEM DAVIDSON ROAD KING" MODELS

54) After positioning a suitable drain pan, remove the oil filter.

55) Following the pipes back from the oil filter mount, unscrew the pipe from the oil pump. Unclamp and pull the hose off of the end of the other pipe.

56) Unbolt and remove the oil filter mount from the motorcycle.

57) Mount the oil filter relocating plate under the rectifier so that the filter mount is on the driver's left side. The filter mount bolts to the relocation plate so that after the filter is screwed on, it is above the rectifier. The oil filter relocation bracket may need to have the filter mount holes elongated with a round file or die grinder so the filter will tuck in closer to the frame.

58) Remove hard lines and pinch nuts from the oil filter mount. Tap both pinch nuts with an 1/8" national pipe thread tap. Clean out all shavings from pinch nuts. .

59) Screw in supplied 1/8" x 1/4" brass barb fittings and tighten.

60) Install pinch nuts back into filter mount leaving seals in place. Find a 1-1/2" to 2" piece of straight pipe from leftover hard pipe and cut it out. Deburr all ends and flare slightly.

61) Install remaining brass barb fitting into oil pump outlet. Connect supplied 3/8" hose with clamps between oil pump outlet and oil filter inlet.

62) The short piece that is flared on both ends is used to go between the end of the hose from the oil sump, and the hose you must add to it to go to the oil filter outlet.

63) Check all fittings and clamps for tightness. Fill a new oil filter with engine oil and quickly attach it to the filter mount.

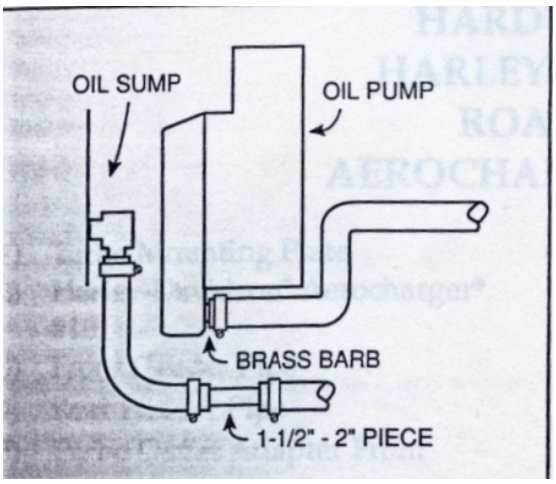
64) The front forks should be pressurized to 12+ PSI to provide more resistance to bottoming out.

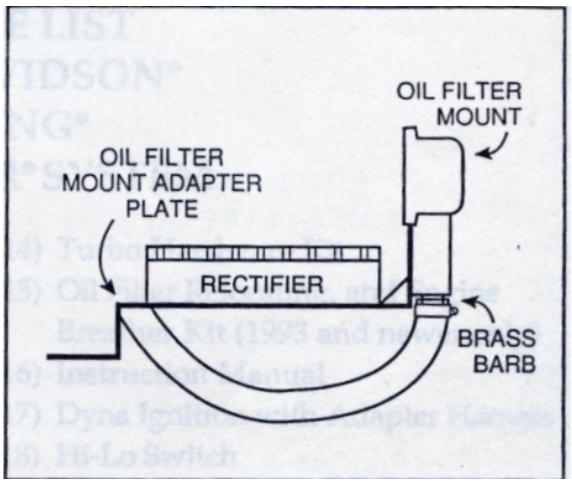
IT IS UNDESIRABLE FOR THE FRONT FENDER TO BUMP THE OIL FILTER IN ITS NEW LOCATION. ALL EFFORT IS BEING MADE TO HELP YOU PREVENT THIS FROM HAPPENING.

65) The crankcase breather kit is used to hold the carburetor onto the intake manifold, as well as vent the engine. Remove all parts from the breather kit and become familiar with the order in which they will be assembled onto the motorcycle.

66) Insert the supplied hollow vent bolt into the mounting hole of the carburetor retention bracket and place one 1/2" washer on the bolt *(see illustration on page 15)*.

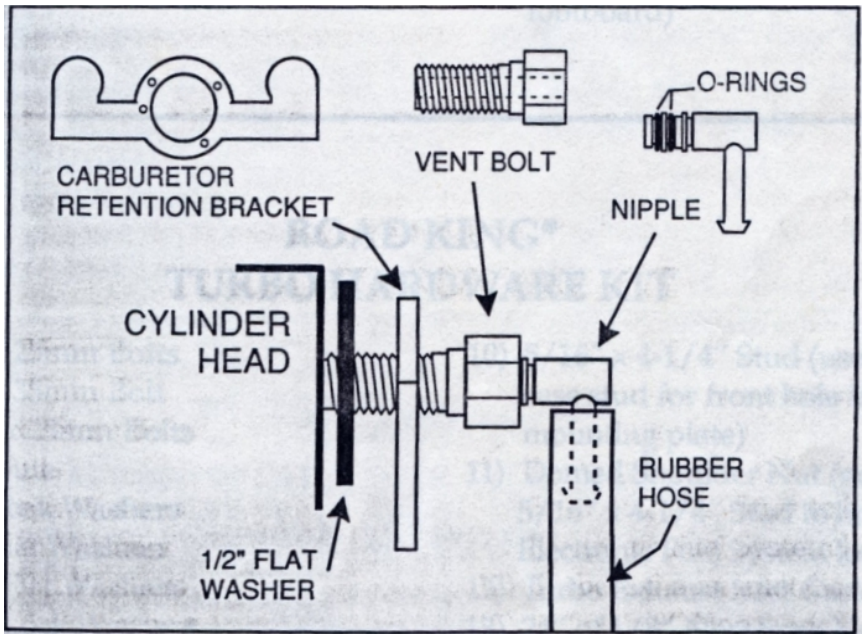
67) Repeat this assembly procedure for the other hollow bolt. Both bolts should now be threaded into the cylinder heads, hand-tight.





OIL PUMP/FILTER SYSTEM

HARLEY-DAVIDSON ROAD KING
1993 & NEWER MODELS



CRANKCASE VENT KIT

HARLEY-DAVIDSON ROAD KING
1993 & NEWER MODELS

HARDWARE LIST
HARLEY-DAVIDSON
ROAD KING
AEROCHARGER SYSTEM

(1) Turbo Mounting Plate
(1) Harley-Davidson Aerocharger #101
(1) Front Header Pipe
(1) Rear Header Pipe
(1) Turbo Outlet Adapter Front
(1) Turbo Outlet Pipe Rear
(1) Intercooler Assembly
(1) Charge Tube
(1) Vortex and Carburetor (with cables)
(1) Air Filter (with bonnet)
(1) Electronic Fuel System
(1) Turbo Camshaft
(1) Megaphone Pipe with Mounting Hardware
(1) Turbo Hardware Kit
(1) Oil Filter Relocating, and Engine Breather Kit (1993 and newer only)
(1) Instruction Manual
(1) Dyna Ignition with Adapter Harness
(1) Hi-Lo Switch
(1) Premium Head Gaskets with Fire Rings

1995 and Later Road Kings

(2) 3/4" Aluminum Spacers and (2) x 1/4 - 20 x 2" Bolts (for spacing out master cylinder reservoir)
(4) Washers (for spacing out right footboard)

ROAD KING
TURBO HARDWARE KIT

(3) 8mm x 25mm Bolts
(1) 8mm x 35mm Bolt
(3) 10mm x 25mm Bolts
(5) 8mm Nuts
(5) 8mm Lock Washers
(7) 8mm Flat Washers
(3) 10mm Flat Washers
(3) 10mm Lock Washers
(1) 5/16" Chrome Acorn Nut (for Turbo Mount Plate)
(1) 5/16" 4-1/4" Stud (used to replace case stud for front hole in turbo mounting plate)
(1) Turbo Exhaust Inlet Gasket
(1) 24" of 1/8" Norphene Hose
(2) 6" Wire Ties
(1) Turbo Inlet Gasket

Domed Shoulder Nut (goes on 5/16" x 4-1/4" Stud to hold Electronic Fuel System lower mount)

ROAD KING
INTERCOOLER KIT

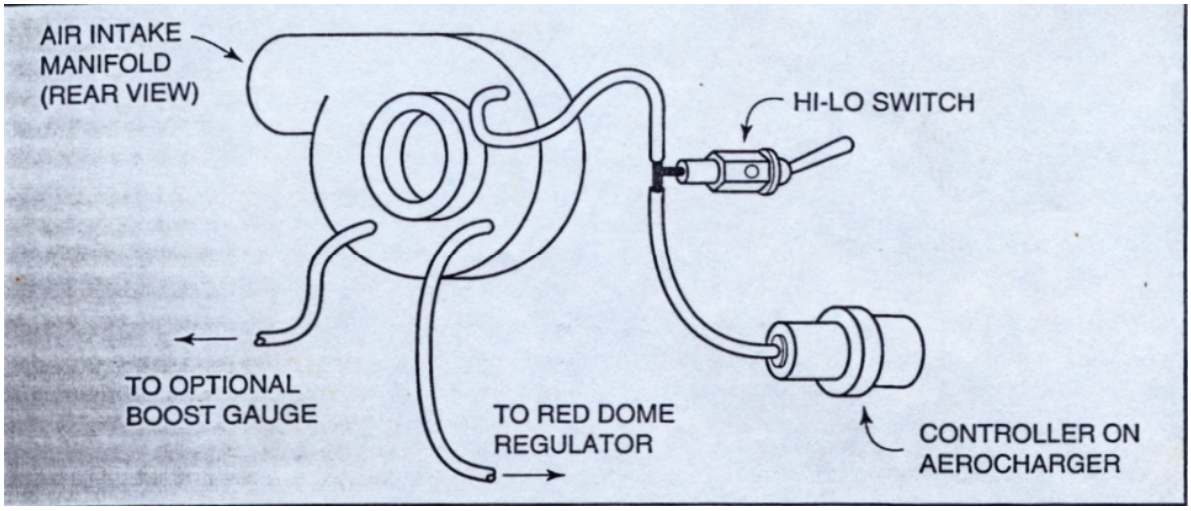
(1)	Intercooler	(2)	5/16" Chrome Acorn Nuts
(1)	#19 Strap Clamp	(2)	1" Rubber Mounts
(4)	x 5/16" Flat Washers	(2)	5/16" x 3/4" Bolts
(4)	x 5/16" Lock Washers		

ROAD KING
OIL FILTER RELOCATING
& ENGINE BREATHER KIT

(1)	42" of 3/8" Oil Hose	(1)	Crankcase Breather Filter
(1)	Oil Filter Mount Relocating Bracket	(1)	Crankcase Breather Hardware Pkg:
(2)	8mm x 25mm Bolts		(2) x hollow bolts
(2)	8mm Nuts		(2) x breather nipples
(2)	8mm Flat Washers		(2) x sections of rubber hose
(1)	Coil of Crankcase Breather Hose	(3)	1/8" x 1/4" Brass Barb Fittings
(5)	#6 Hose Clamps for Oil Filter Relocation	(2)	1/2" Washers to space out carb mounting bracket

ROAD KING
MEGAPHONE MOUNTING
HARDWARE

(1)	Megaphone Pipe	(1)	2-1/4" Stainless Hose Clamp
(1)	2” Pipe Clamp		



HI-LO SWITCH DIAGRAM

FOR ALL HARLEY-DAVIDSON
MOTORCYCLES

FINAL CHECKING/WARM UP PROCEDURES

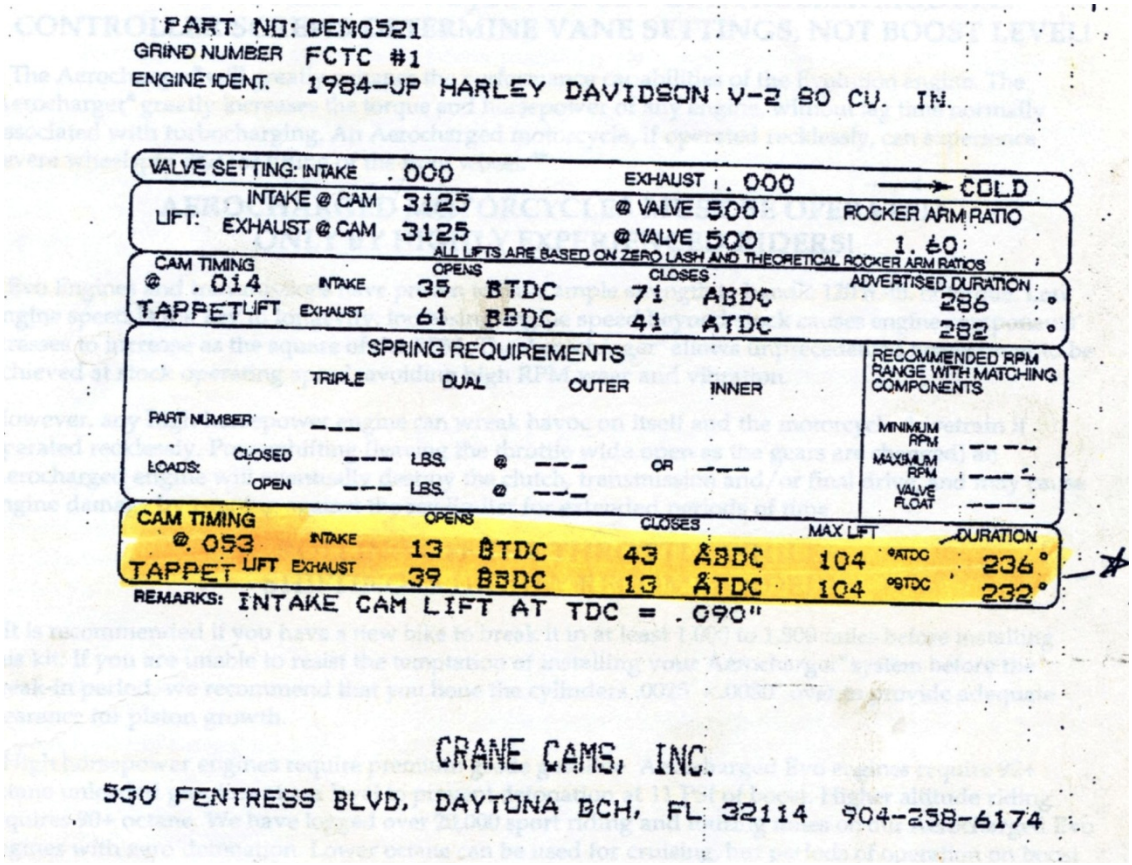
- Thoroughly check over your installation, making sure everything is tight.
- You may wish to place a small bead of weather strip adhesive around the outside of the Aerocharger air intake. Warm up the rubber air filter neck with a hair dryer. Work the neck down over the adhesive on the turbo air intake, and then tighten the clamp.
- Thoroughly warm up the engine, stop, allow to cool and then retighten everything again. The use of a thread locking agent is recommended to help keep nuts and bolts tight.
- Make sure there are no fuel leaks when the ignition switch is on and the fuel pump is running.
- Remember to warm up your motorcycle every time before riding. When the rocker covers are warm to the touch, the engine is sufficiently warmed up.
- Extended periods of running the engine without air movement can cause the head retaining studs to be pulled out of the cases. This will occur to a stock engine as well as a modified engine. The cylinders will get hot and swell, stretching upwards with sufficient force to pull out the studs, if the engine is allowed to run for extended periods of time.

The management and staff at

FIRST CHOICE TURBO CENTER, INC.

wish you many years of enjoyment
with your Aerocharged motorcycle.

Appendix 1
Cam Specs



PART NO: OEM0521
GRIND NUMBER FCTC #1
ENGINE IDENT. 1984-UP HARLEY DAVIDSON V-2 80 CU. IN.

VALVE SETTING: INTAKE .000 EXHAUST .000 → COLD

LIFT: INTAKE @ CAM 3125 @ VALVE 500
EXHAUST @ CAM 3125 @ VALVE 500
ROCKER ARM RATIO 1.60
ALL LIFTS ARE BASED ON ZERO LASH AND THEORETICAL ROCKER ARM RATIOS

CAM TIMING @ .014 TAPPET LIFT		OPENS	CLOSES	ADVERTISED DURATION
	INTAKE	35 BTDC	71 ABDC	286 °
	EXHAUST	61 BBDC	41 ATDC	282 °

SPRING REQUIREMENTS

	TRIPLE	DUAL	OUTER	INNER
PART NUMBER	---			
LOADS: CLOSED	--- LBS.	@ ---	OR ---	
LOADS: OPEN	--- LBS.	@ ---		

RECOMMENDED RPM RANGE WITH MATCHING COMPONENTS
MINIMUM RPM ----
MAXIMUM RPM ----
VALVE FLOAT ----

CAM TIMING @ .053 TAPPET LIFT		OPENS	CLOSES	MAX LIFT	DURATION
	INTAKE	13 BTDC	43 ABDC	104 °ATDC	236 °
	EXHAUST	39 BBDC	13 ATDC	104 °BTDC	232 °

REMARKS: INTAKE CAM LIFT AT TDC = .090"

CRANE CAMS, INC.
530 FENTRESS BLVD. DAYTONA BCH, FL 32114 904-258-6174